

~~DEVICE ON A PERFORATED CYLINDER, THROUGH WHICH A MEDIUM FLOWS FROM
THE OUTSIDE TOWARD THE INSIDE~~
SUCTION-TYPE CONVEYOR DRUM FOR WEB TREATMENT

CROSS REFERENCE TO RELATED APPLICATIONS

5 This application is the US national phase of PCT
application PCT/EP2004/052842 filed 8 November 2004 with a claim to
the priority of German patent application 10353115.7 itself filed
12 November 2003, whose entire disclosure are herewith incorporated
by reference.

10 FIELD OF THE INVENTION

 The invention pertains to a device for the flow-through
treatment of textile materials, formed fabrics or paper by means of
a gaseous or liquid treatment medium [[being]] that is circulated
in the device, ~~with A perforated or foraminous cylinder~~
15 cylindrical drum [[that]] is provided with bottom end plates on the
~~faces and the~~ has an interior of which that is subjected to
suction, ~~wherein~~ The cylinder cylindrical drum serves as a
transport conveyor element and its periphery outer surface is
covered with a wire gauze, ~~wherein unbend mesh.~~ Sheet-metal strips
20 are arranged extend between the bottom end plates of the cylinder
cylindrical drum ~~such that they extend in a~~ straight fashion from
one bottom end plate to the other bottom end plate and their width
extends in the radially direction, ~~wherein~~ Connecting elements are
arranged between the sheet-metal strips and uniformly distributed
25 over the length of the cylinder cylindrical drum. ~~wherein~~ These
connecting elements have a width that corresponds to the nominal

distance or spacing between two directly adjacent sheet-metal strips and are rigidly connected to the adjacent sheet-metal strips, ~~and wherein the respective~~ Each connecting element is realized ~~in a web-shaped fashion, formed as a thin bar and is~~ provided with at least one bore ~~in the peripheral direction of~~ extending angularly in the cylinder cylindrical drum in order to accommodate at least one screw and/or a similar threaded fastening element, and can be connected to the two adjacent sheet-metal strips or connecting elements.

A device of this type is known from EP-A-0 315 961 (US equivalents 4,811,574 and 4,912,945). It has the unsurpassed advantage of a very high air permeability that is achieved without reducing the stability of the cylinder cylindrical drum. The ~~peripherally~~ angularly extending connecting elements are rigidly connected all around the cylinder cylindrical drum to the sheet-metal strips extending ~~[[over]]~~ the length of the cylinder cylindrical drum by means of the ~~proposed~~ provided screw connection such that a welded construction is not required. This makes it possible to eliminate the disadvantageous structural changes in the metal that occur when the otherwise required welding seams are produced.

The connecting elements according to EP-A-O 315 961 only have a wall thickness that is sufficient for their stability. This is the reason why they are ~~realized in a web-shaped fashion and~~ formed as solid bars that are somewhat thicker in the region of the screws than in the central region in order to accommodate the screws. It was determined in practical applications that ~~soiling~~

fouling occurred at the transitions from the walls to the central region at the height level of the screws, as well as at other locations. Lint accumulated on the connecting elements and impaired the flow-through effect.

OBJECT OF THE INVENTION

The invention is based on the object ~~[[ive]]~~ of developing a construction, in which not only ~~soiling~~ fouling of the connecting elements is eliminated, but the flow-through effect is even advantageously improved.

SUMMARY OF THE INVENTION

Based on the device according to EP-A-O 315 961, this object ~~[[ive]]~~ is attained in that the connecting element is realized shaped in a flow-promoting fashion over at least part of its radial length. This can be realized by designing each of the radially directed ~~outer region~~ edges of the connecting elements in the shape of an arrow, ~~wherein~~ The connecting element then extends with this width ~~[[up]]~~ radially inward to the radially inner screw ~~[[s]]~~ and is then once again advantageously ~~pointed in~~ an arrow-shaped fashion. Between the screws, the width of the body is only of insignificant stability-related importance such that the body can be realized in a hollow fashion at this location for weight reasons.

BRIEF DESCRIPTION OF THE DRAWING

A device according to the invention is illustrated in an exemplary fashion in the figures. ~~Therein figures show:~~

FIG. 1 ~~[[,]]~~ is a section ~~[[along]]~~ through a conventional perforated ~~cylinder device~~ cylindrical drum, the

sleeve of which consists of a strip-shaped sheet-metal structure with an outer wire ~~[[gauze]]~~ mesh;

FIG. 2 ~~[[,]]~~ is an enlarged axial section analogous to FIG. 1 through the sleeve of ~~this-known~~ the prior-art perforated
5 ~~cylinder device~~ cylindrical drum;

FIG. 3 ~~[[,]]~~ is an analogous enlarged section through a novel connecting element, and

FIG. 4 ~~[[,]]~~ shows the connecting element according to FIG. 3 in ~~the form of~~ a section that extends perpendicular to that
10 shown in FIG. 3.

SPECIFIC DESCRIPTION

The perforated ~~cylinder device~~ cylindrical drum according to FIG. 1 corresponds, e.g., to that disclosed in EP-A-0 315 961. The application hereby refers to the disclosure of this
15 publication.

A perforated ~~cylinder device~~ cylindrical drum essentially consists of an approximately rectangular housing 1 that is subdivided into a treatment chamber 3 and a fan chamber 4 by means of an intermediate wall 2. The perforated cylinder 5 is rotatably
20 supported in the treatment chamber 3 on an axis A, and a fan 6 is rotatably supported ~~concentrically thereto~~ coaxially therewith in the fan chamber 4. Naturally, the fan chamber 4 may also be arranged in an unillustrated not-shown fan housing that is realized separate ly-of from the perforated cylinder housing 1. In any
25 case, the fan 6 subjects the interior of the cylinder 5 to suction. This ~~patent also pertains~~ system can also be applied to a cylinder construction for a wet treatment device that may merely serve for

removing liquid by suction. The entire construction needs to be adapted accordingly in this case.

According to FIG. 1, heating units 7 are ~~respectively~~ arranged above and underneath the fan 6, ~~wherein~~ The heating units 7 consist of pipes ~~[[,]]~~ through which a heating medium flows. In the region that is not covered by ~~[[the]]~~ a textile material 9, the perforated cylinder 5 is internally protected from the suction draught by means of an interior inner cover 8. The effective skin of the perforated cylinder is formed by the sheet-metal strip structure according to FIG. 2 that is described further below. The outside of this sheet-metal strip structure is covered by a fine-meshed screen 19 that is held under tension on the face of the cylinder on the two bottom end plates 11, 12.

The known sheet-metal strip structure consists of axially ~~aligned~~ extending sheet-metal strips 10, the radially extending height extent of which is ~~elucidated~~ shown in FIG. 2. Therefore, the screen-like cover 19 only lies on the radially outer edges of the sheet-metal strips 10. The sheet-metal strips 10 are ~~adjacently~~ fixed on the two bottom end plates 11, 12 at a defined distance from one another by means of ~~not-shown~~ unillustrated screws. In order to fix this spacing over the width of the cylinder, connecting elements are provided that serve as spacers and are identified as a whole ~~by the reference symbol at~~ 20, ~~wherein~~ the connecting elements ~~[[are]]~~ being connected to the sheet-metal strips 10 by means of screws 29, 29' and 30, 30'.

According to FIG. 2, the connecting elements 20 feature each have a rectangular flange 22 at their surfaces that contact

the sheet-metal strip 10. The radially outer region of the connecting element 20 consists of ~~[[the]]~~ a web 24. The connecting element 20 also features has a radially inner widened leg 28 while the remaining region of the connecting element is realized with a narrow cross section except at the height level of ~~[[the]]~~ openings 25, 27 for accommodating the screws. The ~~connection between the~~ connecting elements 20 ~~is realized~~ are connected together by means of rods 29, 29' and 30, 30' that are provided with threads at least on their two ends ~~, wherein so that~~ nuts 31 ~~[[are]]~~ subsequently can be screwed onto these threaded ends within a connecting element 20'.

The novel connecting element 20" according to FIGS. 3 and 4 is realized in an altogether streamlined fashion in its radial direction. It features has a radially oppositely directed arrow point sharp edges 34, 35 that offers less resistance to the fluid flowing past the connecting element 20" on its two ends that are provided with the bores 32, 33. Between the region at the height level of the bores 32, 33, the width of the connecting element 20" remains unchanged, namely in accordance with the width required for the bores 34, 35. Due to this shape of the connecting element 20", it no longer ~~contains~~ has an edge or groove that could be a cause for ~~soiling~~ fouling.

In order to reduce the weight, the central region of the connecting element 20" is ~~provided with a~~ hollowed out to form a chamber 36, the walls 37, 38 of which are only sufficiently thick for the stability and extend parallel to one another with ~~the same~~ uniform thickness.

The cross-sectional width of the walls 37, 38 at the height level of the hollow chamber 36 also corresponds approximately to the width of the walls at the height level of the bores 32, 33 as illustrated in FIG. 4.

5 The connecting element 20" according to FIGS. 3, 4 is cast in one piece from metal. The only subsequent processing required are the bores 32, 33. The individual screws 29, 30, ~~the points of which are provided with a hollow~~ each have one end formed with an internal thread and ~~the heads of which are provided with normal spike~~ an opposite end formed with an external thread ~~s~~ that fit into the hollow internal thread ~~s, need to so they can~~ be connected into a circle around the cylinder ~~by means of to form~~ a so-called lock in at least one location. The required ~~[[stove]]~~ through bolt has a larger diameter at least in this one location. The connecting element 20" 15 according to FIG. 3 is no longer usable. In order to attain the above-described object ~~[[ive]]~~, the connecting element may merely consist at this location of an arrow-shaped piece of bent sheet-metal that is bent in the shape of an arrow at least in this 20 location, wherein the sheet metal has having the same wall thickness as the walls 37, 38, but is otherwise realized made hollow ~~in order~~ to accommodate the lock.